

Lesson 17 – Representing Inequalities on Number Lines

Starter

- 1) $345 + 129$
- 2) Change 34% to a decimal
- 3) Work out $\frac{2}{5}$ of 30
- 4) Find 35% of 80
- 5) Write down the number “thirteen hundredths” as a decimal

Starter Answers

- 1) 474 2) 0.34 3) 12 4) 28 5) 0.13

An **inequality** is when we say one amount is **greater** or **less** than another amount. It is when we have a range of values as the answer instead of just one answer. For example, instead of saying x equals 5, an inequality would be that x is greater than 5.

We would use the inequality symbols:

$A > B$	A is greater than B
$A < B$	A is less than B
$A \leq B$	A is less than or equal to B
$A \geq B$	A is greater than or equal to B

We've already seen how we can place numbers onto number lines. How do we represent an inequality on a number line?

Example 1

Represent the following inequalities on a number line

a) $x > 3$

This means “numbers greater than 3”

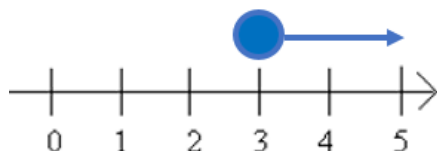
x cannot be 3 as it is strictly greater than. To show this we have a unshaded circle above 3.



b) $x \geq 3$

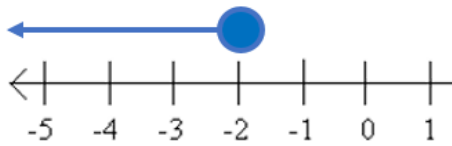
This means “numbers greater than or equal to 3”

x is allowed to equal 3. To show this, we have a shaded in circle above 3.



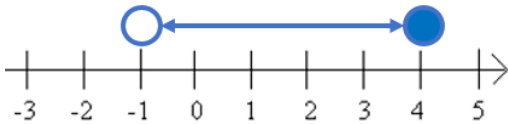
c) $x \leq -2$

This means "numbers less than or equal to -2"
 x is allowed to equal -2, so we have a shaded in circle.



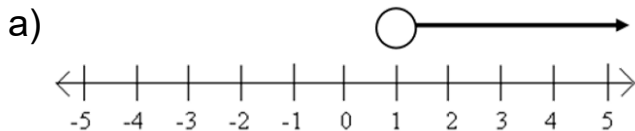
d) $-1 < x \leq 4$

This means "numbers between -1 and 4, including 4 but not including -1"



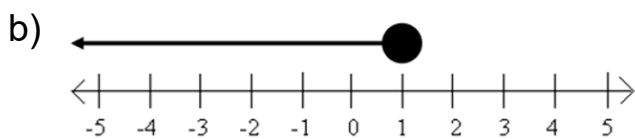
Example 2

Write down the inequality that is represented by each number line



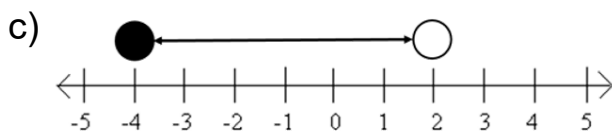
This is pointing to all numbers greater than 1. It is an unshaded circle so 1 is not included.

The inequality is $x > 1$



This is pointing to all numbers less than 1. It is a shaded circle so 1 is included.

The inequality is $x \leq 1$



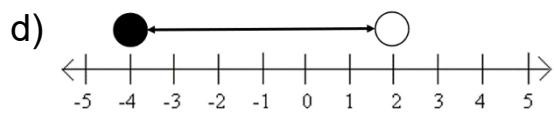
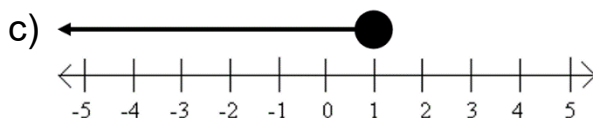
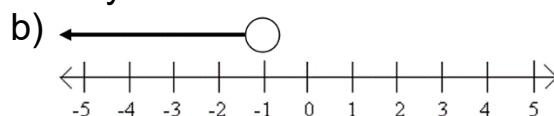
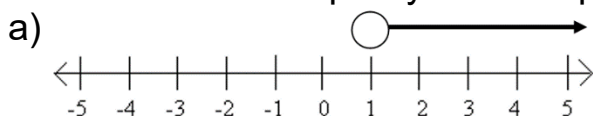
This is pointing to all numbers between -4 and 2.

There is a shaded circle above -4 so -4 is not included. There is an unshaded circle above 2, so 2 is not included.

The inequality is $-4 \leq x < 2$

Your go

Write down the inequality that is represented by each of these number lines



Answers

1) $x > 1$

2) $x < -1$

3) $x \leq 1$

4) $-4 \leq x < 2$